

SEQUENCE LISTING

<110> MASTROIANNI, NADIA
CAINARCA, SILVIA
CORAZZA, SABRINA

<120> PHOTOPROTEINS WITH ENHANCED BIOLUMINESCENCE AND ASSAYS
USING THE SAME

<130> 100506-00028

<140> 10/587,523

<141> 2006-03-09

<150> 05005390.9

<151> 2005-11-03

<150> 06000171.6

<151> 2006-05-01

<160> 24

<170> PatentIn Ver. 3.3

<210> 1

<211> 198

<212> PRT

<213> Clytia gregaria

<400> 1

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190

Tyr Gly Asn Phe Val Pro
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<210> 2
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 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 protein construct

<400> 2
 Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
 20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
 35 40 45

Ala Ser Asp Asp Ile Ser Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
 50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
 65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
 85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190

Tyr Gly Asn Phe Val Pro
195

<210> 3

<211> 198

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
protein construct

<400> 3

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
115 120 125

Gly Ser Gly Cys Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
180 185 190

Tyr Gly Asn Phe Val Pro
195

<210> 4
 <211> 198
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 protein construct

<400> 4
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 1 5 10 15
 Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
 20 25 30
 Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Arg
 35 40 45
 Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
 50 55 60
 Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
 65 70 75 80
 Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
 85 90 95
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
 100 105 110
 Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
 115 120 125
 Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
 130 135 140
 Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
 145 150 155 160
 Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175
 Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190
 Tyr Gly Asp Phe Val Pro
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<210> 5
 <211> 198
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 protein construct

<400> 5

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 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
 20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
 35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
 50 55 60

Lys Arg His Arg Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
 65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Val Phe Val Asp Gly Trp Lys
 85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175

Gln His Leu Gly Phe Trp Tyr Ile Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190

Tyr Gly Asn Phe Val Pro
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<210> 6

<211> 198

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 protein construct

<400> 6

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
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<210> 7
<211> 198
<212> PRT
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Synthetic protein construct

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<400> 7
Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
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Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
          20                      25                      30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
          35                      40                      45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
  50                      55                      60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
  65                      70                      75                      80

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Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
 85 90 95
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
 100 105 110
 Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
 115 120 125
 Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Cys Arg Ile
 130 135 140
 Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
 145 150 155 160
 Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175
 Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190
 Tyr Gly Asn Phe Val Pro
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<210> 8
 <211> 198
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 protein construct

<400> 8
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 1 5 10 15
 Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
 20 25 30
 Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
 35 40 45
 Ala Ser Asp Asp Val Cys Ala Lys Leu Gly Ala Thr Pro Glu Gln Thr
 50 55 60
 Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
 65 70 75 80
 Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
 85 90 95
 Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
 100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
130 135 140

Ser Gly Ile Cys Arg Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
180 185 190

Tyr Gly Asn Phe Val Pro
195

<210> 9

<211> 198

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
protein construct

<400> 9

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
1 5 10 15

Asp Asp Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
20 25 30

Asp Ile Asn Gly Asp Gly Lys Val Thr Leu Asp Glu Ile Val Ser Lys
35 40 45

Ala Ser Asp Asp Ile Cys Ala Arg Leu Gly Ala Thr Pro Glu Gln Thr
50 55 60

Lys Arg His Gln Asp Ala Val Glu Ala Phe Phe Lys Lys Ile Gly Met
65 70 75 80

Asp Tyr Gly Lys Glu Val Glu Phe Pro Ala Phe Val Asp Gly Trp Lys
85 90 95

Glu Leu Ala Asn Tyr Asp Leu Lys Leu Trp Ser Gln Asn Lys Lys Ser
100 105 110

Leu Ile Arg Asp Trp Gly Glu Ala Val Phe Asp Ile Phe Asp Lys Asp
115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190

Tyr Gly Asn Phe Val Pro
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<210> 10

<211> 198

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
 protein construct

<400> 10

Met Ala Asp Thr Ala Ser Lys Tyr Ala Val Lys Leu Arg Pro Asn Phe
 1 5 10 15

Asp Asn Pro Lys Trp Val Asn Arg His Lys Phe Met Phe Asn Phe Leu
 20 25 30

Asp Ile Asn Gly Asp Gly Lys Ile Thr Leu Asp Glu Ile Val Ser Lys
 35 40 45

Ala Ser Asp Asp Ile Cys Ala Lys Leu Glu Ala Thr Pro Glu Gln Thr
 50 55 60

Lys Arg His Gln Val Cys Val Glu Ala Phe Phe Arg Gly Cys Gly Met
 65 70 75 80

Glu Tyr Gly Lys Glu Ile Ala Phe Pro Gln Phe Leu Asp Gly Trp Lys
 85 90 95

Gln Leu Ala Thr Ser Glu Leu Lys Lys Trp Ala Arg Asn Glu Pro Thr
 100 105 110

Leu Ile Arg Glu Trp Gly Asp Ala Val Phe Asp Ile Phe Asp Lys Asp
 115 120 125

Gly Ser Gly Ser Ile Ser Leu Asp Glu Trp Lys Ala Tyr Gly Arg Ile
 130 135 140

Ser Gly Ile Cys Ser Ser Asp Glu Asp Ala Glu Lys Thr Phe Lys His
 145 150 155 160

Cys Asp Leu Asp Asn Ser Gly Lys Leu Asp Val Asp Glu Met Thr Arg
 165 170 175

Gln His Leu Gly Phe Trp Tyr Thr Leu Asp Pro Asn Ala Asp Gly Leu
 180 185 190

Tyr Gly Asn Phe Val Pro
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<210> 11
<211> 600
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
nucleotide construct

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accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
taccacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggctgcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctggac 540
ttctggtaca ccctggaccc caatgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 12
<211> 600
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
nucleotide construct

<400> 12
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tgggtgaacc ggcacaagtt catgttcaac ttcctggaca tcaacggcga cggcaagatc 120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggctgcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca ccctggaccc caatgccgac ggctgtacg gcaacttcgt gccttgataa 600

<210> 13
<211> 600
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
nucleotide construct

<400> 13

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atggccgaca cgcagcaaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60
tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc 120
accctggacg agatcgtgag cagggccagc gacgacatct gcgccaagct gggcgccacc 180
cccagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatt 240
gactacggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca ccctggaccc caacgccgac ggcctgtacg gcgacttcgt gccttgataa 600

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<210> 14

<211> 600

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
nucleotide construct

<400> 14

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atggccgaca cgcagcaaa gtacgccgtg aagctgaggc ccaacttcga caaccccaag 60
tgggtgaacc ggcacaagtt catgttcaat ttcttgga tcaacggcga cggcaagatc 120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
cccagcaga ccaagagaca ccgggacgcc gtggaggcct tcttcaagaa gatcggcatt 240
gactacggca aggaggtgga gttccccgtc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgtttgaca tcttcgacaa ggacggcagc ggcagcatta gcctggatga gtggaaggcc 420
tacggtagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca tcttggaacc caacgccgac ggcctgtacg gcaacttcgt gccttgataa 600

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<210> 15

<211> 600

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
nucleotide construct

<400> 15

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tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc 120
accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
cccagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatt 240
gacttcggca aggaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaat aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagaagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca ccctggaccc caacgccgac ggcctgtacg gcaacttcgt gccttgataa 600

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<210> 16
 <211> 600
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide construct

<400> 16
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 accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
 cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
 gactacggca aggaggtgga gttccccgcc ttcttgga gctggaagga gctggccaac 300
 tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
 gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
 tactgcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
 tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
 ttctggtaca ccctggaccc caacgccgac ggcctgtacg gcaacttcgt gccttgataa 600

<210> 17
 <211> 600
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide construct

<400> 17
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 tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaagatc 120
 accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct gggcgccacc 180
 cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240
 gactacggca aggaggtgga gttccccgcc ttcttgga gctggaagga gctggccaac 300
 tacgacctga agctgtggag ccaaaaacaag aagagcctca tcagggactg gggcgaggcc 360
 gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggacga gtggaaggcc 420
 tacggcagaa tcagcggcat ctgcagaagc gacgaggacg ccgaaaagac cttcaagcac 480
 tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
 ttctggtaca ccctggaccc caacgccgac ggcctgtacg gcaacttcgt gccttgataa 600

<210> 18
 <211> 600
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 nucleotide construct

<400> 18
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 tgggtgaacc ggcacaagtt catgttcaac ttcttgga tcaacggcga cggcaaggct 120
 accctggacg agatcgtgag caaggccagc gacgacatct gcgccaaggct gggcgccacc 180
 cccgagcaga ccaagagaca ccaggacgcc gtggaggcct tcttcaagaa gatcggcatg 240

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gactacggca aagaggtgga gttccccgcc ttcgtggacg gctggaagga gctggccaac 300
tacgacctga agctgtggag ccagaacaag aagagcctca tcagggactg gggcgaggcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatca gcctggatga gtggaaggcc 420
tacggcagaa tcagcggcat ctgcagcagc gacgaggacg ccgaaaagac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccagaca gcacctgggc 540
ttctggtaca ccctggaccc caacgccgac ggcctgtacg gcaacttcgt gccttgataa 600

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<210> 19

<211> 597

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
nucleotide construct ,

<400> 19

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accctggacg agatcgtgag caaggccagc gacgacatct gcgccaagct ggaggccacc 180
cccgagcaga ccaacgggca ccaagtgtgc gtggaggcct tcttcgcggg ctgcggcatg 240
gagtacggca aggagatcgc cttccccagc ttcctggacg gctggaagca gctggccaca 300
agcgagctga agaagtgggc ccggaacgag ccaccctga tccgcgagtg gggcgacgcc 360
gtgttcgaca tcttcgacaa ggacggcagc ggcagcatct ctctggacga gtggaaggcc 420
tacggccgga tcagcggcat ctgcagcagc gacgaggacg ccgagaaaac cttcaagcac 480
tgcgacctgg acaacagcgg caagctggac gtggacgaga tgaccgggca gcacctgggc 540
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<210> 20

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 20

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gatgacgacg acaagatggc cgacaccgcc ag 32

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<210> 21

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
primer

<400> 21

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gaggagaagc ccggtttatc aaggacacga agt 33

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<210> 22
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 22
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33

<210> 23
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 primer

<400> 23
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27

<210> 24
 <211> 99
 <212> DNA
 <213> Homo sapiens

<400> 24
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 gtgcccgcgc ccaagatcca ttctttggga tccgccacc 99